

Claims

1. A fuel oil additive which comprises an oil-soluble metal salt of organic acid of a general formula MR , where R is an organic acid radical and the corresponding organic acid is a $C_1 - C_{40}$ saturated or unsaturated fatty acid or polybasic carboxylic acid, naphthenic acid, aromatic acid or alkylphenol, M is a metal cation, metal complex ion or metal clathrate compound ion, and the corresponding metal is an alkali metal, alkali-earth metal, rare-earth metal, transition metal selected from zinc or titanium or main group metal selected from metal aluminum, gallium, germanium, indium, tin or antimony.
2. A fuel oil additive as claimed in Claim 1, wherein the organic acid is a $C_1 - C_{25}$ saturated or unsaturated fatty acid, naphthenic acid, aromatic acid or alkylphenol.
3. A fuel oil additive as claimed in Claim 2, wherein the organic acid is a $C_1 - C_{10}$ saturated or unsaturated fatty acid, naphthenic acid, aromatic acid or alkylphenol.
4. A fuel oil additive as claimed in Claim 1, wherein the alkali metal is lithium, sodium, potassium, rubidium or cesium, and the corresponding cation is a monovalent ion.
5. A fuel oil additive as claimed in Claim 1, wherein the alkali-earth metal is beryllium, magnesium, calcium, strontium or barium, and the corresponding cation is a divalent ion.
6. A fuel oil additive as claimed in Claim 1, wherein the rear-earth metal is scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium or lutetium, and the corresponding cation is a trivalent or tetravalent ion.
7. A fuel oil additive as claimed in Claim 6, wherein the rear-earth metal is scandium, yttrium, lanthanum, cerium or neodymium.
8. A fuel oil additive as claimed in Claim 1, wherein the transition metal is titanium, zirconium, hafnium, niobium, tantalum, molybdenum, tungsten, ruthenium, osmium, cobalt, rhodium, iridium, nickel, palladium, platinum, silver, gold or zinc, and the corresponding cation is a monovalent, divalent, trivalent or tetravalent ion.
9. A fuel oil additive as claimed in Claim 8, wherein the transition metal is titanium, cobalt, nickel or zinc.

10. A fuel oil additive as claimed in Claim 1, wherein the metal is aluminum, gallium, germanium, indium, tin or antimony, and the corresponding cation is a trivalent, tetravalent or pentavalent ion.
11. A fuel oil additive as claimed in Claim 1, which comprises one or more of the oil-soluble metal salts of organic acids.
12. A fuel oil additive as claimed in Claim 1, which also comprises an alcohol, ether, ketone, phenol, hydrocarbon, ester, aldehyde or nitrogen-containing compounds.
13. A fuel oil additive as claimed in any of the claims, wherein the aforesaid metal salt of organic acid originates from a saturated or unsaturated fatty acid or a compound formed by a naphthenic acid and an alkali metal cation or an alkali-earth metal cation.
14. A fuel oil additive as claimed in any of the claims, which includes a gasoline additive, diesel oil additive, kerosene, heavy oil additive and resid additive.
15. Uses of a fuel oil additive as claimed in any of the Claims 1 – 13 as gasoline antiknock agent, fuel oil cleaning agent, fuel oil antifriction agent or fuel oil anticorrosion additive.
16. A gasoline antiknock agent which comprises an oil-soluble metal salt of organic acid of a general formula MR, where R is an organic acid radical and the corresponding organic acid is a C₁ – C₄₀ saturated or unsaturated fatty acid or polybasic carboxylic acid, naphthenic acid, aromatic acid or alkylphenol, M is a metal cation, a metal complex ion or a metal clathrate compound ion, and the corresponding metal is an alkali metal, alkali-earth metal, rare-earth metal, transition metal or main group metal selected from metal aluminum, gallium, germanium, indium, tin or antimony.
17. A gasoline antiknock agent as claimed in Claim 16, wherein the organic acid is a C₁ – C₂₀ saturated or unsaturated fatty acid, naphthenic acid, aromatic acid or alkylphenol.
18. A gasoline antiknock agent as claimed in Claim 17, wherein the organic acid is a C₁ – C₁₀ saturated or unsaturated fatty acid, a naphthenic acid, an aromatic acid or an alkylphenol.
19. A gasoline antiknock agent as claimed in Claim 16 - 18, wherein the organic acid is a saturated or unsaturated fatty acid or naphthenic acid.
20. A gasoline antiknock agent as claimed in Claim 16, wherein the alkali metal is lithium,

sodium, potassium, rubidium or cesium, and the corresponding cation is a monovalent ion.

21. A gasoline antiknock agent as claimed in Claim 16, wherein the alkali-earth metal is beryllium, magnesium, calcium, strontium or barium, and the corresponding cation is a divalent ion.

22. A gasoline antiknock agent as claimed in Claim 16, wherein the rear-earth metal is scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium or lutetium, and the corresponding cation is a trivalent or tetravalent ion (wrong words "divalent or trivalent ion" in the original claim, translator).

23. A gasoline antiknock agent as claimed in Claim 22, wherein the rear-earth metal is scandium, yttrium, lanthanum, cerium or neodymium.

24. A gasoline antiknock agent as claimed in Claim 16, wherein the transition metal is titanium, zirconium, hafnium, niobium, tantalum, molybdenum, tungsten, ruthenium, osmium, cobalt, rhodium, iridium, nickel, palladium, platinum, silver, gold or zinc, and the corresponding cation is a monovalent, divalent, trivalent or tetravalent ion.

25. A gasoline antiknock agent as claimed in Claim 24, wherein the transition metal is titanium, cobalt, nickel or zinc.

26. A gasoline antiknock agent as claimed in Claim 16, wherein the metal is aluminum, gallium, germanium, indium, tin or antimony, and the corresponding cation is trivalent, tetravalent or pentavalent ion.

27. A gasoline antiknock agent as claimed in Claim 16, which comprises one or more of the oil-soluble metal salts of organic acids.

28. A gasoline antiknock agent as claimed in Claim 16, which also comprises an alcohol, ether, ketone, phenol, hydrocarbon, ester, aldehyde or nitrogen-containing compounds.

29. A gasoline antiknock agent as claimed in Claims 16, wherein the metal salt of organic acid originates from a saturated or unsaturated fatty acid or a compound formed by a naphthenic acid and an alkali metal cation or an alkali-earth metal cation.

30. A fuel oil product, wherein the fuel oil additive as claimed in Claim 1 is added, and the amount is 0.1 – 15 g of the metal salt of organic acid per liter of the fuel oil.

31. A fuel oil product as claimed in Claim 30, which is a gasoline product.

32. A gasoline product, wherein the gasoline antiknock agent as claimed in Claim 16 is added, and the amount is 0.1 – 15 g of the metal salt of organic acid per liter of the gasoline.